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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,211	05/20/2004	Hiroyuki Ohta	520.43863X00	7003

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EXAMINER	
LEE, EUGENE	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/849,211	OHTA ET AL.	
	Examiner	Art Unit	
	Eugene Lee	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3 and 6-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3,6 and 9* is/are allowed.

6)☒ Claim(s) *7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 8 is objected to because of the following informalities: on line 8, the limitation "said gate pillar a said gate electrode" contains a typographical error. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung 6,198,121 B1 in view of Forbes 6,049,106. Sung discloses (see, for example, FIG. 10b) a cell structure (semiconductor device) comprising a semiconductor substrate 1, tower-like gate pillar, silicon oxide layer (insulation layer) 2, intrinsic silicon region (channel region) 14c, source region/drain region (impurity diffusion regions) 14b/14d, gate insulator layer (gate insulation film) 11, and first polysilicon layer/tungsten spacers (first electrode film/second electrode film) 6/8. Sung does not disclose said first electrode film and said second electrode film each including a polycrystalline silicon film, or said second electrode film being a film including WSi, CoSi, WiSi, TiSi or RuSi. However, Forbes discloses (see, for example, FIG. 1, and column 3, lines 6-8) a vertical thin film transistor comprising gates 24, 26 wherein the gates may comprise one of many suitable conductive materials such as polysilicon (polycrystalline silicon film), and

tungsten silicide (WSi). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to use one of these materials in either the first electrode film or second electrode film in order to have a conductive gate material for applying a voltage since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Also, the use of conventional materials to perform their known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962). Degani teaches that any conventional material can be used that is known to be capable of protecting underlying layers, which could include any of those materials listed in claims 8-14. Furthermore, as chemical composition of the protective layer does not seem to be critical to the invention, it must be shown that any one or all of the listed materials yield an **unexpected** product or result. *In re Margolis* 228 USPQ 940 (Fed. Cir. 1986); *In re Kirsch* 182 USPQ 286 (CCPA 1974); *In re Suether* 181 USPQ 36 (CCPA 1974); *In re Costello* 178 USPQ 290 (CCPA 1973); *In re Von Schickh* 150 USPQ 300 (CCPA 1966); *In re Sussman* 60 USPQ 538 (CCPA 1944); *In re Kaplan* 45 USPQ 175 (CCPA 1940).

Regarding the limitations "outer circumferential side of said gate pillar", see, for example, column 4, lines 12-15 wherein Sung discloses a diameter (circumferential).

Regarding the limitation "first electrode film", and "second electrode film", see, for example, FIG. 10b wherein Sung discloses a first polysilicon layer (first electrode) 6, and tungsten spacers (second electrode) 8.

Allowable Subject Matter

4. Claims 3, 6, and 9 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The references of record, either singularly or in combination, do not teach or suggest at least a semiconductor device comprising: wherein said gate electrode is formed of a plurality of stacked layers including a first electrode film and a second electrode film formed on an outer circumferential side of said first electrode film; and wherein said first electrode film has an end thereof spaced from said wiring layer, and said second electrode film is formed so as to electrically connect with said wiring layer.

Regarding claim 6, the references of record, either singularly or in combination, do not teach or suggest at least a semiconductor device comprising: wherein said gate electrode film includes a first electrode film formed as to enclose said gate pillar from a circumferential direction thereof, and a second electrode film formed so as to enclose said first electrode film from a peripheral side thereof, and wherein said first electrode film is formed with grain size smaller than that of said second electrode film.

Regarding claim 9, the references of record, either singularly or in combination, do not teach or suggest at least a semiconductor device comprising: wherein said gate electrode film includes a first electrode film formed as to enclose said gate pillar from a circumferential direction thereof, and a second electrode film formed so as to enclose said first electrode film from a peripheral side thereof, and wherein said channel region is formed with a grain size greater than that of said first electrode film or said second electrode film.

Response to Arguments

5. Applicant's arguments with respect to claims 3, 6, and 7-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eugene Lee
July 22, 2006